BENDIX TANDEM DIAPHRAGM

American Motors
Chevrolet
Chrysler Corp.

DESCRIPTION

Unit is a self-contained, vacuum-hydraulic power unit and is vacuum-suspended type. It uses engine intake manifold vacuum to take advantage of atmospheric pressure for power. Unit consists of three basic parts: Vacuum power chamber comprised of front and rear shell, center plate, tandem front and rear diaphragms (with plate assembly), hydraulic push rod and vacuum diaphragm, and diaphragm return spring; mechanically actuated control valve, integral with power diaphragms, consisting of single poppet with atmospheric and vacuum ports; tandem master cylinder.

REMOVAL & INSTALLATION

AMERICAN MOTORS

Removal – Disconnect vacuum lines and hydraulic lines at master cylinder. From under instrument panel, disconnect push rod from brake pedal and remove nuts securing power unit to dash.

Installation – Reverse removal procedure and bleed brakes.

NOTE – *There are two holes in American Motors brake pedals, install brake pedal bolt in the lower hole.*

GENERAL MOTORS CORP.

Removal – Disconnect vacuum lines and hydraulic lines. Disconnect rod from brake pedal. Unbolt power unit and remove from vehicle.

Installation – Reverse removal procedure and bleed system.

CHRYSLER CORP.

Removal – Disconnect master cylinder from power unit. Disconnect vacuum line from check valve. From under dash, remove push rod from brake pedal and remove nuts securing power unit to dash.

Installation – Reverse removal procedure and bleed brakes.

OVERHAUL

POWER UNIT

NOTE – *American Motors and Chrysler Corp. do not recommend overhaul of this power brake unit.*

Disassembly – 1) Scribe a mark across master cylinder flange and power unit halves for reassembly reference. Then remove the following components in order.

- Master cylinder.
- Push rod and seal.
- Slide seal from push rod.
- Vacuum check valve and grommet, if necessary.

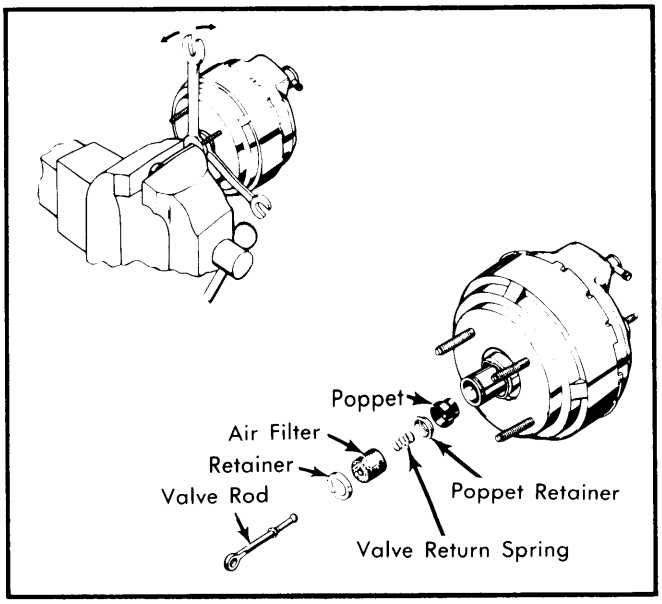

Fig. 1 Valve Rod Disassembly Showing Way to Pry Air Valve Off Ball End of Rod and Exploded View of Valve Rod Components

2) From rear plate hub, remove the following components:

- Dust guard retainer.
- Dust guard and silencers.

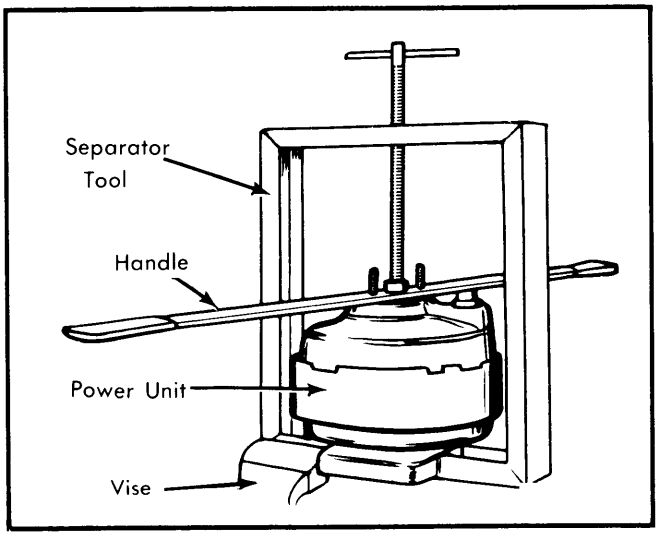

Fig. 2 Separating Front and Rear Housings Showing Separator Tool and Spanner Handle

3) Reinstall steel retainer on rear plate hub.

4) Squirt denatured alcohol down operating valve rod to lubricate valve plunger rubber grommet.

5) Position two small blocks of wood, one on each side of air valve rod. Place air valve rod into a vise.

6) Leave room for two wrenches between vise and rear plate hub. See *inset in Fig. 1*.

BENDIX TANDEM DIAPHRAGM (Cont.)

7) Use wrench nearest vise to pry air valve off ball end of rod. Be careful to not damage plastic hub or allow vacuum cylinder to fall.

8) Straighten the four deepest lances on rear housing, being careful not to break them. If any lance breaks, housing must be replaced.

9) Remove push rod and vacuum seal from front housing.

10) Attach a holding fixture (J-22805) firmly to front housing. Place holding fixture in separator tool or arbor press. See *Fig.* 2.

11) Apply slight downward pressure and turn front housing counterclockwise to release housing. Tap lightly with plastic hammer if necessary.

12) Remove diaphragm and seal from rear housing.

13) Wet rear diaphragm retainer with denatured alcohol and remove retainer (using fingers only).

14) Place a holding tool (J-22839) in a vise. Place diaphragm and plate assembly on holding tool.

15) Twist rear plate counterclockwise to loosen plate from diaphragm. Remove assembly from vise.

16) Unscrew rear plate. Remove rear plate. Be sure to catch air valve plunger and return spring as parts are separated.

17) Remove the following parts.

- Square ring seal from front diaphragm plate hub.
- Reaction disc from inside front diaphragm plate hub.
- Slide center plate off hub of front plate.
- Diaphragms from plates.
- Seal from rear housing, using a 1¼" socket.

Cleaning & Inspection – Clean all metal and rubber parts in alcohol. Remove rusted or corroded spots from metal areas with crocus or emery cloth. Dry all components with compressed air. Just before reassembly, rewash all metal components coming in contact with hydraulic fluid, in clean alcohol. Dry with compressed air. Use all parts included in repair kit and discard all old rubber parts.

Reassembly – 1) Install the following components.

- New bearing and seal into cavity in rear housing. Surface of seal should be 5/16" below inside surface of rear housing.
- Reaction disc in hub of front plate with small tip toward hole.

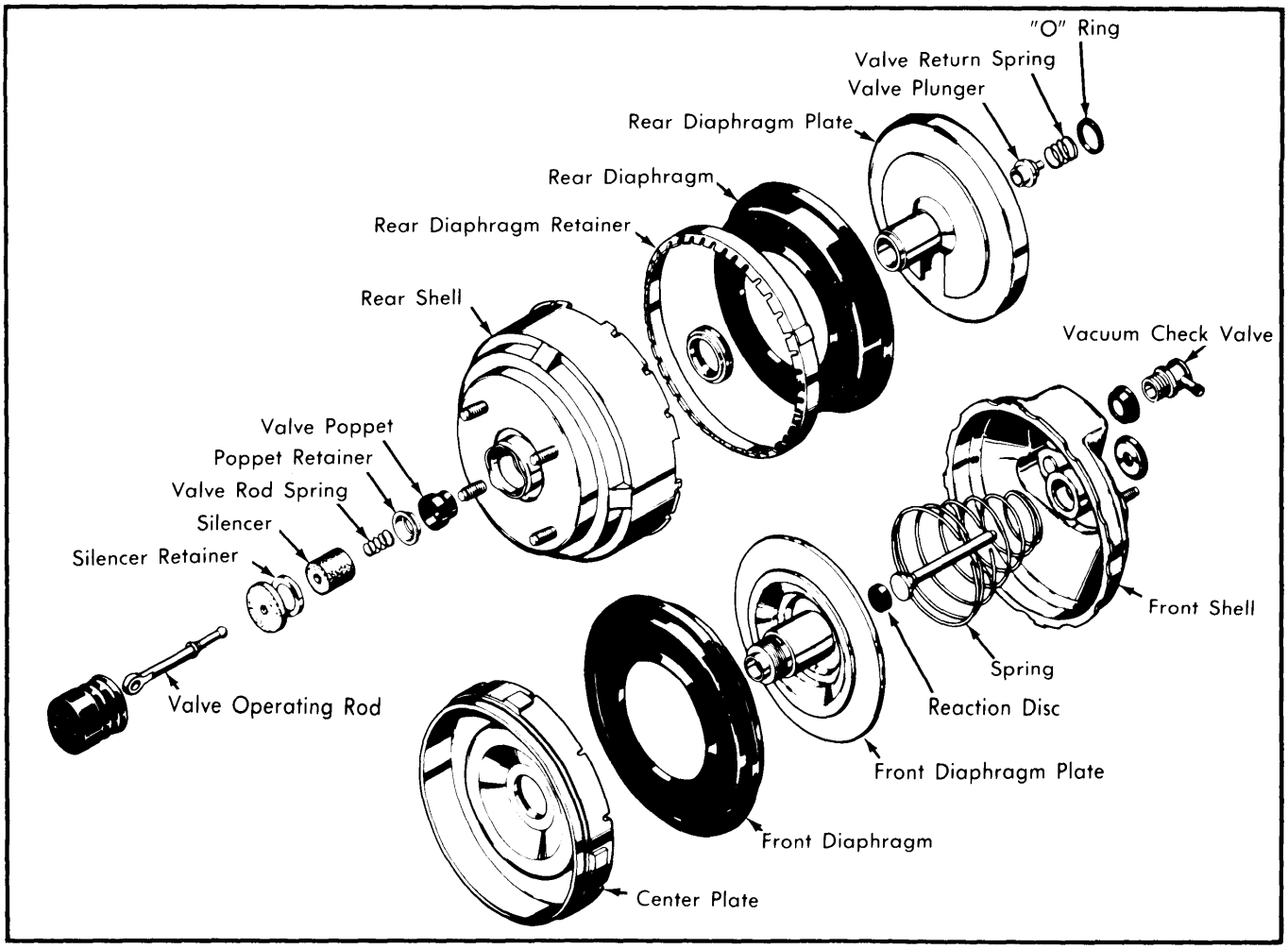

Fig. 3 Exploded View of a Typical Bendix Tandem Diaphragm Power Brake Unit

BENDIX TANDEM DIAPHRAGM (Cont.)

2) Place a holding tool (J-22839) in a vise.

3) Place front plate onto holding tool. Install front diaphragm onto front plate with long fold of diaphragm facing downward.

4) Install seal proctor (J-22733) over threads on front plate hub.

5) Apply a light film of silicone lubricant to front plate hub and to seal in center plate.

6) Install seal then center plate onto front plate hub. Be careful not to damage center plate seal. Remove seal protector (J-22733).

7) Apply light coat of silicone to bearing surfaces of air valve plunger, do not apply silicone to rubber grommet inside plunger. Then install the following:

- Square ring seal on shoulder of front plate hub.
- Valve plunger return spring.
- Valve plunger in base of front plate hub.

8) Set rear plate over hub of front plate.

9) Screw plate on hub, making sure valve and spring are properly aligned. Check valve plunger travel with finger.

10) Assemble rear diaphragm to rear plate. Place lip of diaphragm in groove in rear plate.

11) Install diaphragm retainer over rear diaphragm and lip of center plate.

12) Press retainer until it seats on shoulder of center plate.

13) Apply talcum powder to inside wall of rear housing. Apply silicone to cutouts of front housing and to seal of rear housing.

14) Assembly diaphragm and plate assembly into rear housing. Be careful not to damage seal.

15) Make sure bosses on center plate are aligned between lances in rear housing and seat front diaphragm into rear housing.

16) Install holding fixture to front housing, front housing to separator tool and spanner wrench on rear housing.

With wrenches, holding fixture, and separator tool assembled, proceed as follows:

- Place a 3" long by 2" I.D. pipe over plastic diaphragm plate hub.
- Place a piece of flat steel over end of pipe.
- Install diaphragm return spring, small end against front housing.
- Rotate spanner wrench clockwise until housings are locked together.
- Bend lance tabs (4) back to original position.

17) Remove brake unit from holding fixture and other tools.

18) Assemble the rest of the power brake unit in following order:

- Poppet valve in rear plate hub (lubricated with alcohol) small end first.
- Poppet retainer with shoulder inside poppet.
- Retainer, filters and silencer over ridge on valve rod.
- Return spring over ball end of valve rod.
- Air valve rod into valve plunger (lubricated with alcohol).
- Filters and silencers into hub.
- Retainer onto hub.
- Silencer in dust boot and onto rear housing.
- NEW check valve and grommet.

19) Install push rod into front plate and press seal over push rod and into front housing.

PUSH ROD ADJUSTMENT

Check or adjust push rod height whenever master cylinder and power unit are separated, or braking problems are diagnosed as possible push rod misadjustment. **NOTE** – *American Motors and Chrysler Corp. do not recommend push rod adjustment.*

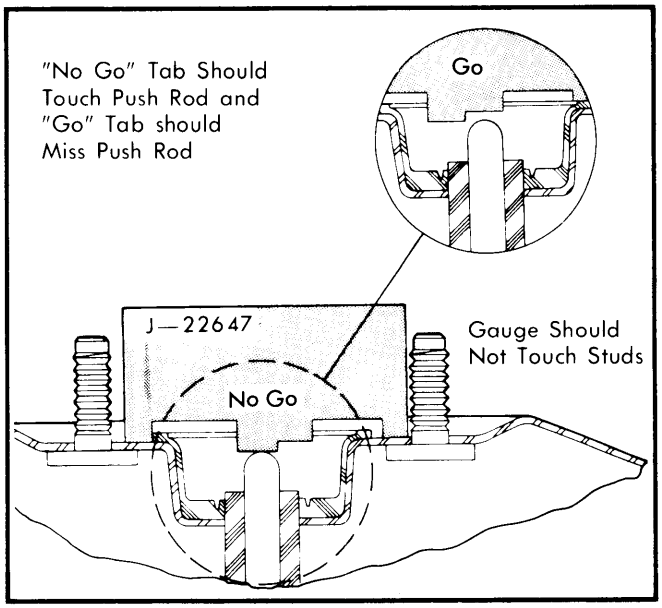

Fig. 4 Using Push Rod "Go-No Go" Height Gauge to Measure Push Rod Height (Chevrolet Only)

1) Place power unit in a padded vise with front housing up. Insert master cylinder piston rod, flat end first, into piston rod retainer.

2) Press on rod to ensure it is properly seated. Remove front housing seal. This will make sure that there is no vacuum in power unit.

3) Place "Go-No Go" gauge (J-22647) over piston rod. Place gauge so that it can be moved left or right without contacting studs.

4) If rod is not within gauge specifications and push rod is not equipped with an adjusting screw, push rod must be replaced.

5) If equipped with an adjusting screw, adjust push rod height to step on gauge.